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(54) Spray-painting gun

(57) Spray-painting gun with a gun body (2) and with a material feeding apparatus (5) which can be connected to each other through a screw-wedge connection, where the screw-wedge connection comprises a screw-wedge element (14) that is placed on the perimeter of an essentially hollow cylindrical adapter piece (10) of the material feeding apparatus (5) and a counter element (15) on the gun body (2) that corresponds to the screw wedge is characterized in that the screw-wedge element (14) with an opening (19) runs over more than half of the perimeter of the adapter piece (10) and that the counter element (15) is placed on a one-sided attachment (16) above a take-up shaft (4) of the gun body (2).

## Spray-painting gun

The invention relates to a spray-painting gun according to the introductory clause of claim 1, an adapter piece for feeding material to a spray-painting gun according to the introductory clause of claim 11 and a paint container according to the introductory clause of claim 17.

With the spray-painting guns known in the art the connection between the gun body and a paint container or another material feeding apparatus, like for example a hose or a feeding tube takes place often through an attachment threading with several threads. For this purpose the gun body has, for example, an adapter shaft provided with female threading into which is screwed an adapter piece of the paint container or adapter piece of the feeding hose, or correspondingly, feeding tube provided with male threading. For this type of adapter, several rotations are, however, necessary for producing a sealed connection, and correspondingly, for separating the connection which requires a not insignificant amount of time.

Spray-painting guns are already known in which the connection between the gun body and a paint container takes place through a so-called screw-wedge connection. This type of connection is disclosed in the German Patent DE 89 02 233 U1. Two screw-wedges, lying opposite each other, are placed on a connection support of the cup-shaped paint container, said screw-wedges are overlapped by two L-shaped protrusions that are opposite of each other and are on the top side of the gun body. For this type of screw-wedge connection, the paint container that is set on the gun body can be secured in place on the gun body through a 90° rotation, or correspondingly can be separated again. Through the intended 90° rotation, the angle of inclination of the wedge surfaces of the two screw-wedges that extend to the extensions have to correspondingly be chosen to be high, where then no self-locking is insured and the danger of the connection loosening exists. Furthermore, the manufacturing of the two L-shaped protrusions, that lie opposite each other, on the gun body and the screw-wedges belonging to these is relatively involved and therefore is associated with corresponding high costs.

The objective of the invention is to create a cost-effectively producible and simple to handle connection possibility for feeding the material to a spray-painting gun.

This objective is solved through a spray-painting gun with the features of claim 1, through an adapter piece with the features of claim 11 and through a paint container with the features of claim 17. Advantageous embodiments and advantageous further developments of the invention are reported in the dependent claims.

In comparison to the conventional connecting possibilities, through the invented concept a user-friendly and fast assembly and disassembly of a material feeding apparatus, like for example, a paint cup, a feeding tube or a hose is made possible in an especially easy and cost-effective manner. No involved connecting or sealing elements are necessary.

The screw-wedge elements provided for engaging with a corresponding counter-element on the gun body runs over more than half of the perimeter of the adapter piece, where between the start and end of the screw-wedge element exists an opening. A one-sided attachment located above a take-up shaft of the gun body can engage in this opening, if the adapter piece is inserted with a lower guiding section into the take-up shaft. The counter-element for engaging in the screw-wedge element is placed on the one-sided attachment. The screw-wedge element and the counter-element are synchronized with each other such that through rotating the adapter piece, inserted into the take-up shaft, the screw-wedge element locks within the counter-element such that the adapter piece is held in the gun body. Because the screw-wedge element extends over more than half of the perimeter, the angle of inclination of the locking surfaces can be reduced, through this a self-locking can be insured.

In a useful design, the screw-wedge element is designed as a wedge profile protruding from the adapter piece and the counter-element corresponding to this is designed as a wedge groove placed on the inner side of the attachment. In a corresponding manner, the wedge groove can, however, also be designed as the adapter piece and the protruding wedge profile can be on the attachment.

In another advantageous design, a sealing surface is provided on the adapter piece, said sealing surface extends to the sealing mechanism on a corresponding mechanism surface on the inside of the take-up shaft while attaching the adapter piece to the gun body.

In another useful design, an additional attachment threading is provided on a lower insert of the connecting piece. This attachment threading is intended for engaging with a female threading, which is provided in the known spray-painting guns for attaching the paint container. Thus, the adapter piece can also be used for conventional spray-painting guns which have a conventional female threading in the take-up shaft.

The adapter piece can be designed, for example, as an adapter for the connection with a conventional paint container or with another material feeding apparatus. The adapter piece can, however, also be designed as a piece that is securely connected to the paint container or similar to this or can be a single piece with the paint container.

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Additional special attributes and advantages of the invention result from the following description of a preferred design example with the aid of the drawings.

Figure 1 shows an inventive spray-painting gun with a detached paint container in a total representation and in an enlarged representation of the connection area between gun body and paint container; Figure 2 shows an invented spray-painting gun with an attached paint container in a total representation and in an enlarged representation of the connection area between gun body and paint container; Figure 3 shows a standard spray-painting gun with female threading and a detached paint container in a total representation and in an enlarged representation of the connection area between gun body and paint container; Figure 4 shows a standard spray-painting gun with female threading and an attached paint container in a total representation and in an enlarged representation of the connection area between gun body and paint container and Figure 5 shows an additional design example of an invented spray-painting gun with paint container.

In the Figures 1 and 2 is shown a spray-painting gun 1 which has on its gun body 2 a connecting area 3 with take-up shaft 4 for the separable attachment of a paint container that is designed as a flow-cup 5. A cover 7 that is equipped with a drop stopper 6 serves for closing the flow cup 5 made out of plastic or metal, the cover is secured in a separable manner by a threading 8 or similar onto the upper edge of the flow cup 5. In its lower part 9 that is conical toward the bottom, the flow cup 5 has a shaft into which is securely inserted an adapter piece 10 that is essentially hollow-cylindrical. The adapter piece 10 that is made, for example, out of metal has an upper mounting area 11, provided with a hexagonal head, a connecting area 12 placed below this and a lower guiding section 13 that engages in the take-up shaft 4.

On the outer perimeter of the cylindrical connecting area 12 is located a screw-wedge element 14 that runs over a part of its perimeter, said element engages in a counter-element 15, that corresponds to said element, is on the inner side of an attachment 16 above the take-up shaft 4 on the adapter piece 3 of the gun body 2. The screw-wedge element 14 consists, in the represented design, of a wedge-profile that protrudes radially towards the outside, the wedge profile has a trapezoidal cross-section and runs in a screw line with an angle of inclination  $\varphi$  over  $\frac{1}{4}$  of the perimeter of the cylindrical connecting area 12. An opening 19 for engaging with the attachment 16 is provided on the outer perimeter of the connecting piece 12 between the lower beginning 17 and the upper end 18 of the screw-wedge element 14. The counter-element 15 is designed as a screw-shaped wedge groove which also has an angle of inclination  $\varphi$ .

On the lower end of the adapter piece 10 is located a conical sealing surface 20 that engages during the insertion of the adapter piece 10 into the take-up shaft 4 to fit onto a corresponding conical counter-surface 21 on the inside of the take-up shaft 4. The position of sealing surface 20 and counter-surface 21 and the position of the screw-wedge element 14 and the counter-element 15 are synchronized for each other such that the beginning 17 of the screw-wedge element 14 engages with play with the counter-element that is designed as a wedge groove during the rotation of the adapter piece that is inserted into the take-up shaft 4 and such that already with a quarter to half rotation an upper wedge surface 24 of the screw-wedge element 14 fits into a corresponding counter-surface 25 of the wedge groove 14.

For the design represented in Figures 1 and 2, an additional attachment threading 22 is provided in the upper part of the grinding area 13, through this threading the flow cup 5 can also be attached to a standard spray-painting gun equipped with female threading, as this is shown in Figures 3 and 4. The additional attachment threading 22 can, however, be shorter than the typical attachment threading such that, for example, only 1.5 to 2 rotations are necessary in order to attach the invented flow cup 5 to conventional spray-painting guns. The inner diameter of the take-up shaft 4 is, in the gun body 2 represented in Figures 1 and 2, a slight bit larger than the outer diameter of the attachment threading 22 such that through the attachment threading 22 a sideways guiding of the adapter piece 10 within the take-up shaft 4 is achieved. A paint sieve, that is not represented, can engage in a lower displaced part 26 of the take-up shaft 4, said sieve is inserted in the lower end of the adapter piece 10. The additional attachment threading 22 is, however, not necessary if the adapter piece 10 is only intended for attaching with the aid of the screw-wedge element 15.

According to Figure 5, a sideways insertion of the adapter piece 10 into the gun body can also be achieved through the lower cylindrical part of the guiding section 13, where between this and an additional removed inner wall 27 of the take-up shaft 4 a small play of, for example, 2/10 mm is provided.

For attaching the previously described flow cup 5 to the spray-painting gun represented in Figure 1 and Figure 2, the adapter piece 10 has to then be inserted in a position into the take-up shaft 6 such that the attachment 16 can engage into the opening 19. If the adapter piece 10 with its lower sealing surface 20 lies on the corresponding counter surface 21 of the take-up shaft 4, the screw-wedge element 14, which is designed as a wedge profile, can then engage with play in the counter-element 15, which is designed as a wedge groove, through corresponding rotation of the flow cup 5, where the upper wedge surface 24 fits into the corresponding counter surface 25 with additional rotating and thus the flow cup 5 is securely locked in a force-locking manner to the gun body 2. Through a partial rotation of the flow cup 5 in the opposite direction, the flow cup can be removed quickly again from the gun body 2.

#### Claims

1. Spray-painting gun with a gun body (2) and with a material feeding apparatus (5) which can be connected to each other through a screw-wedge connection, where the screw-wedge connection comprises a screw-wedge element (14) that is placed on the perimeter of an essentially hollow cylindrical adapter piece (10) of the material feeding apparatus (5) and a counter element (15) on the gun body (2) that corresponds to the screw wedge is characterized in that the screw-wedge element (14) with an opening (19) runs over more than half of the perimeter of the adapter piece (10) and that the counter element (15) is placed on a one-sided attachment (16) above a take-up shaft (4) of the gun body (2).
2. Spray-painting gun according to claim 1 is characterized in that the screw-wedge element (14) is designed as a wedge profile protruding from the adapter piece (10) and the counter-element (15) is designed as a wedge groove placed on the inner side of the attachment (16).
3. Spray-painting gun according to claim 1 or 2 is characterized in that the screw-wedge element (14) and the counter element (15) are designed as an only partially circulating male, and respectively, female threading.
4. Spray-painting gun according to one of the claims 1 to 3 is characterized in that the adapter piece (10) contains a guiding section (13) for the sideways insertion within the take-up shaft (4).
5. Spray-painting gun according to one of the claims 1 to 4 is characterized in that the screw-wedge element (14) has a continuously rising upper wedge surface (24) for fitting to the corresponding counter surface (25) of the counter segment (15).
6. Spray-painting gun according to one of the claims 1 to 3 is characterized in that the screw-wedge element (14) has a triangular or trapezoidal profile.
7. Spray-painting gun according to one of the claims 1 to 4 is characterized in that an additional attachment threading (22) is placed on the adapter piece (10).
8. Spray-painting gun according to one of the claims 1 to 7 is characterized in that a counter surface (21) is provided in the take-up shaft (4) for creating a sealing surface (20) of the connection part (10).
9. Spray-painting gun according to one of the claims 1 to 8 is characterized in that the attachment (16) on the gun body (2) has a smaller width than the opening (19) between the beginning (17) and the end (18) of the screw-wedge element (14).
10. Spray-painting gun according to one of the claims 1 to 9 is characterized in that the material feeding apparatus (5) is a paint container.
11. Adapter piece for the material feed to a spray-painting gun, said adapter piece contains a screw-wedge element (14) for engaging into a corresponding counter element (15) on the gun body (2) of the spray-painting gun (1) is characterized in that the screw-wedge element (14) with an opening (19) runs over more than half of the perimeter of a connecting area (19) of the adapter piece (10).
12. Adapter piece according to claim 11 is characterized in that it contains a guiding section (13) within a take-up shaft (4) of the gun body (2) for sideways guiding.
13. Adapter piece according to claim 11 or 12, is characterized in that the screw-wedge element (14) is designed as a wedge profile that protrudes outwards.
14. Adapter piece according to one of the claims 11 to 13, is characterized in that the screw-wedge element (14) is designed as an only partially circulating male threading.
15. Adapter piece according to one of the claims 11 to 14, is characterized in that the screw-wedge element has a triangular or trapezoidal profile.
16. Adapter piece according to one of the claims 11 to 15, is characterized in that it has an additional attachment threading (22).
17. Paint container for a spray-painting gun is characterized in that it has an adapter piece (10) according to one of the patent claims 11 to 16.
18. Paint container according to claim 17 is characterized in that the adapter piece (10) is securely connected to the paint container (5).
19. Paint container according to claim 17 is characterized in that the adapter piece (10) is designed as one piece with the paint container (5).

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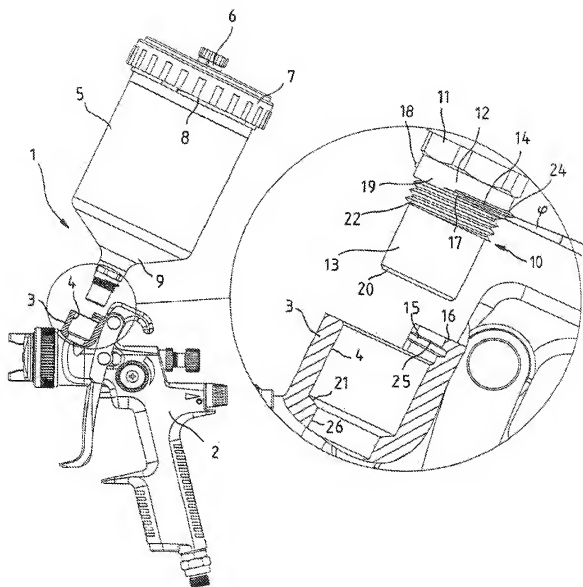


Fig. 1

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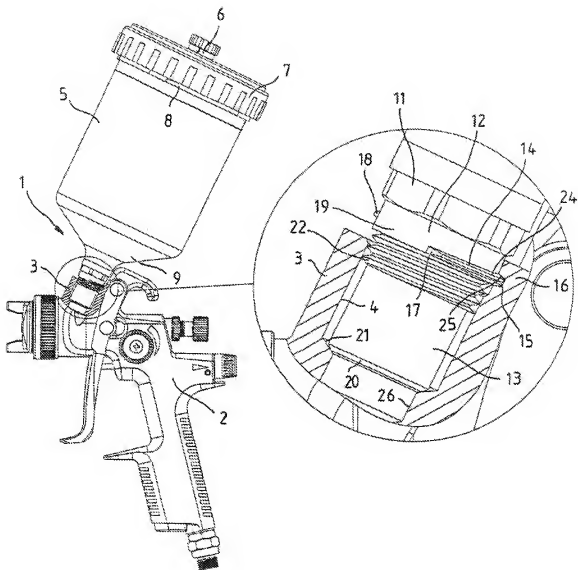


Fig. 2

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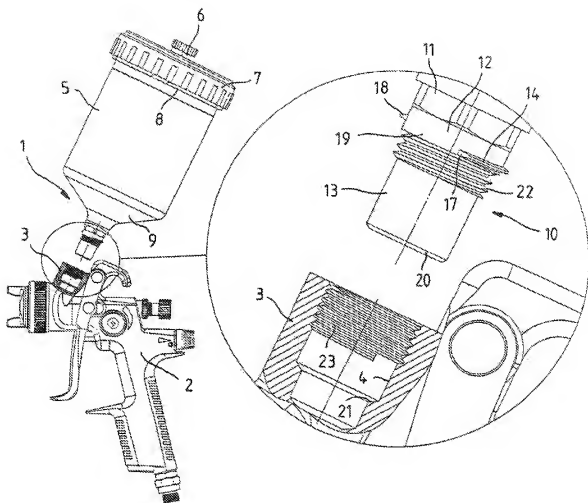


Fig. 3

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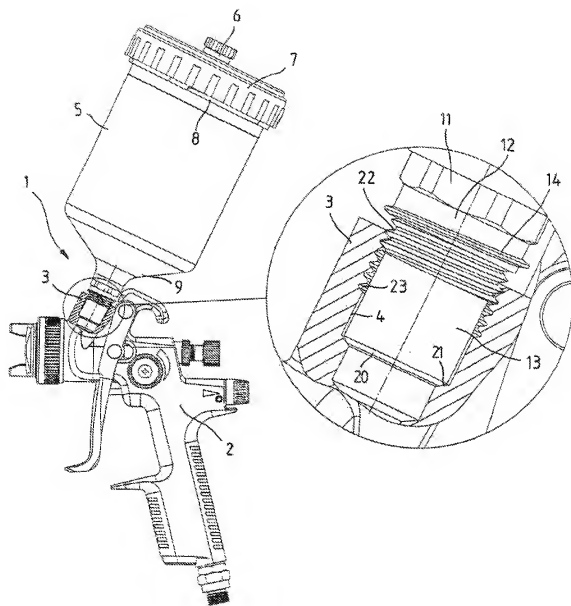


Fig. 4

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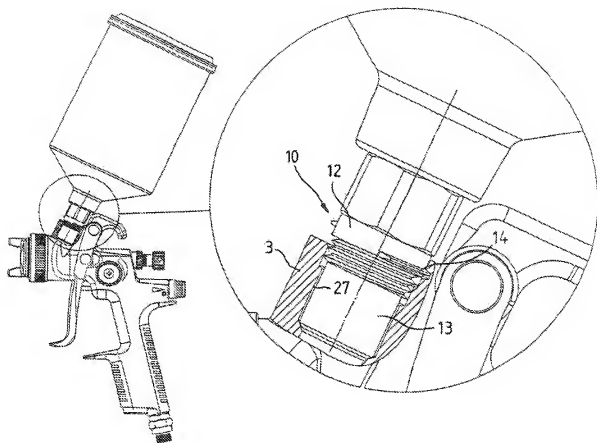


Fig. 5

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